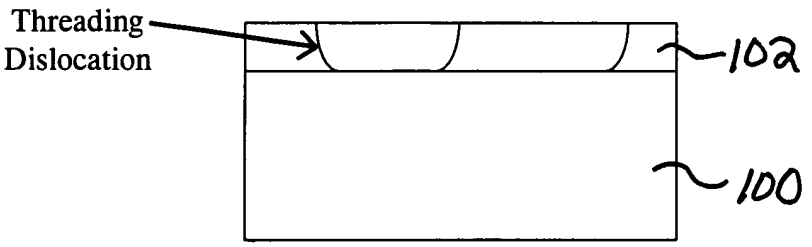

Figure 1A

1. Deposit lattice mismatched layer at low T

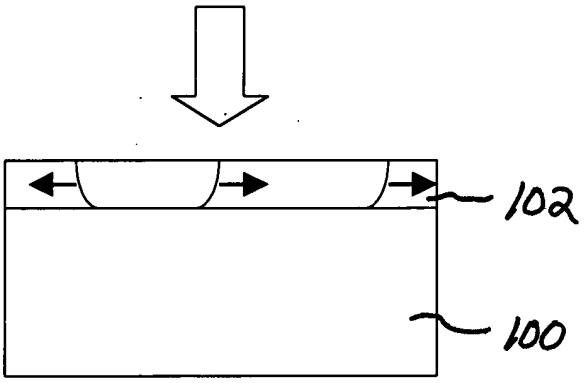

Figure 1B

2. Anneal at high T to increase dislocation flow and reduce dislocation density

4. Repeat anneal and deposition until desired structure is achieved

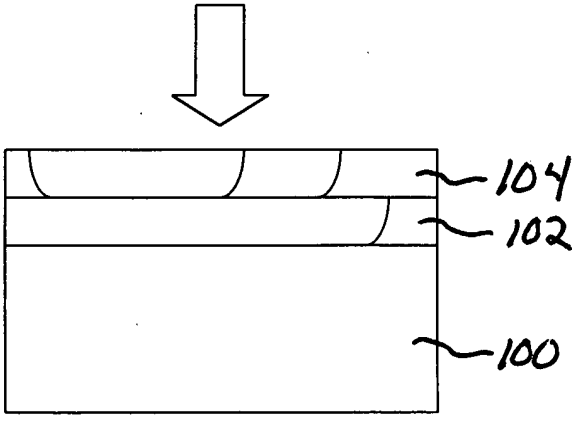

Figure 1C

3. Deposit subsequent layer with increased lattice mismatch at low T

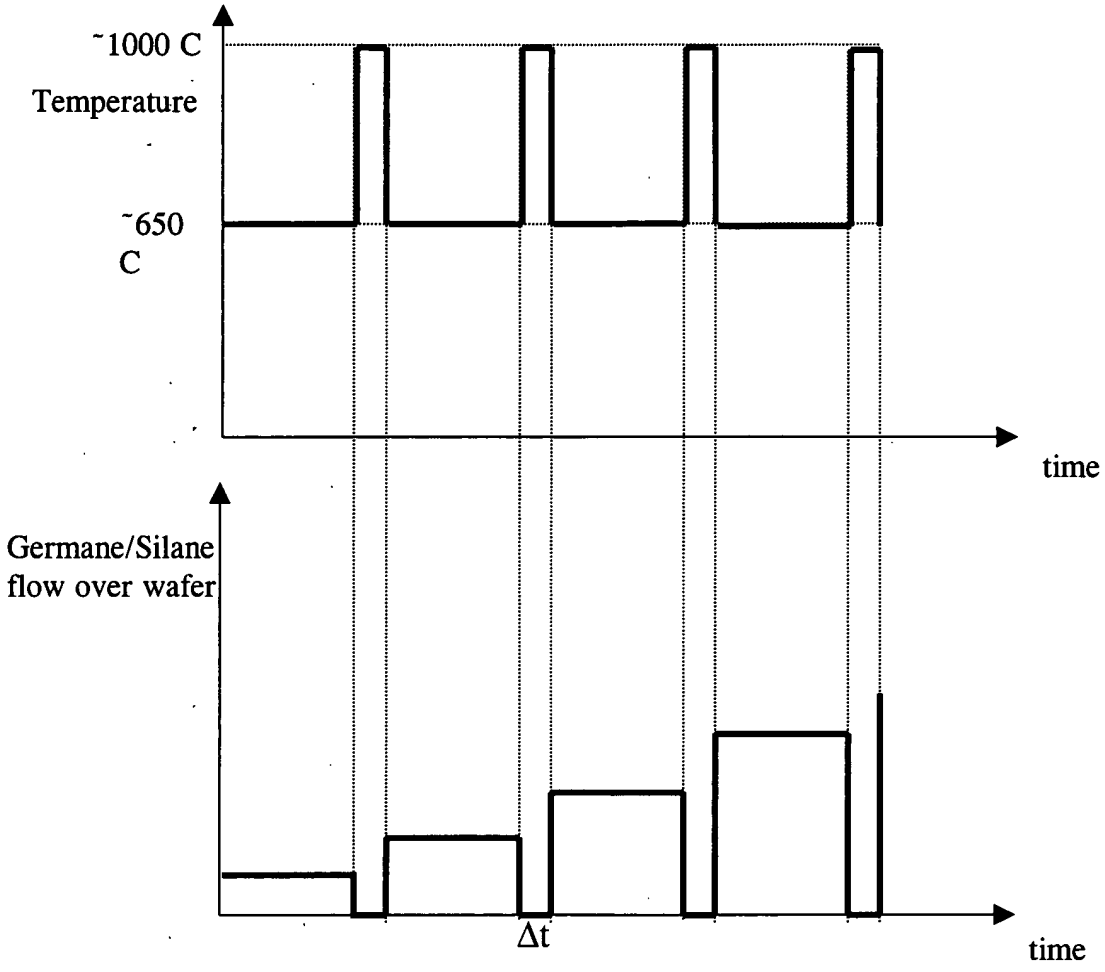
~1000 C
Temperature
~650
C
time
Germane/Silane
flow over wafer
Δt
time

Figure 2

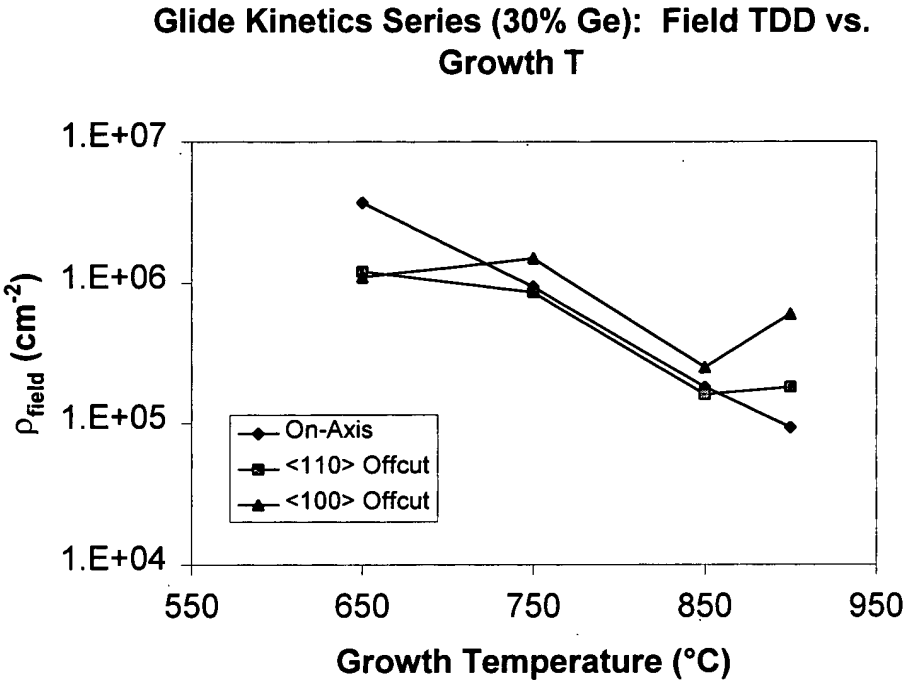
Glide Kinetics Series (30% Ge): Field TDD vs. Growth T
1.E+07
1.E+06
1.E+05
1.E+04
ρ_{field} (cm^{-2})
On-Axis
<110> Offcut
<100> Offcut
550
650
750
850
950
Growth Temperature (°C)

Figure 3

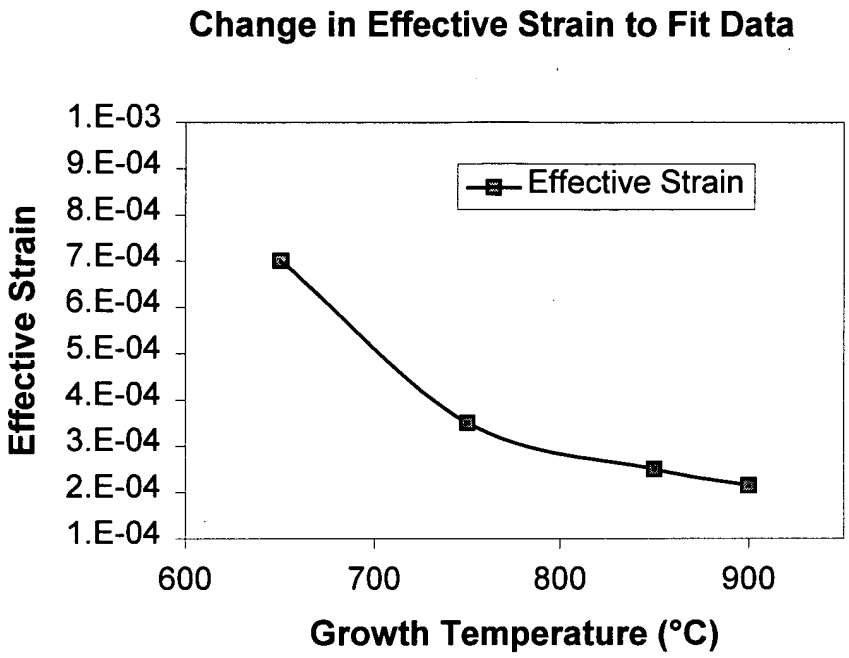
Change in Effective Strain to Fit Data
Effective Strain
1.E-03
9.E-04
8.E-04
7.E-04
6.E-04
5.E-04
4.E-04
3.E-04
2.E-04
1.E-04
600
700
800
900
Growth Temperature (°C)
Effective Strain

Figure 4

Sample	Total Threading Dislocation Density (#/cm^2)	Field Threading Dislocation Density (#/cm^2)
20% SiGe on Si with graded buffer as grown	1.36×10^6	1.31×10^6
20% SiGe on Si with graded buffer after a 5 min anneal at 1050°C	7.25×10^5	5.48×10^5

Figure 5